

549,881

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau(43) International Publication Date  
30 September 2004 (30.09.2004)

PCT

(10) International Publication Number  
**WO 2004/082749 A2**(51) International Patent Classification<sup>7</sup>: **A61M 5/32**

(21) International Application Number:

PCT/CA2004/000174

(22) International Filing Date: 10 February 2004 (10.02.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

10/389,803

18 March 2003 (18.03.2003)

US

2,433,205

25 June 2003 (25.06.2003)

CA

(71) Applicant and

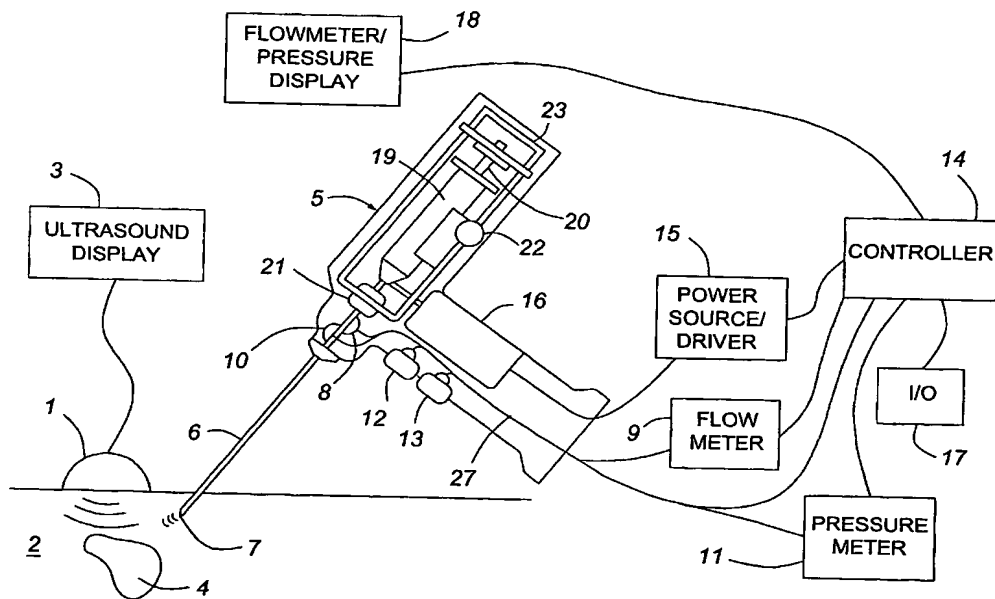
(72) Inventor: **KEENAN, James** [CA/CA]; 840 Norton Avenue, Ottawa, Ontario K2B 5P6 (CA).(74) Agents: **TOO, Constance et al.**; Gowling Lafleur Henderson LLP, 160 Elgin Street, Suite 2600, Ottawa, Ontario K1P 1C3 (CA).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: MEDICAL DEVICES WITH ENHANCED ULTRASONIC VISIBILITY



(57) Abstract: A medical device having enhanced ultrasonic visibility is provided. The device permits localized drug delivery, probe positioning, fluid drainage, biopsy, or ultrasound pulse delivery, through the real-time ultrasound monitoring of the needle tip position within a patient. The device permits controlled dispersion of a drug into solid tissue, the lodging of particles into solid tissue, and drug delivery into specific blood vessels. As a needle is inserted, a fluid that contrasts echogenically with the organ environment is injected into the patient. The fluid travels a brief distance before being slowed and stopped by the patient's tissue and this fluid flow will be detectable by ultrasound. The needle position during insertion will be monitored using ultrasound until it is at the desired point of action. A therapeutic drug is then delivered or a probe inserted

[Continued on next page]

WO 2004/082749 A2



**Published:**

— without international search report and to be republished upon receipt of that report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

---

through the needle to perform therapies such as tumor ablation using RF heating. The fluid flow rate may be adjusted during insertion to maintain a properly defined image of the needle tip. At the point of action, the echogenic fluid can be pulsed, repeatedly and at varying flow rates, until the fluid dispersion pattern is satisfactory and the drug can then be delivered. Ultrasound can also be delivered through the needle using a transducer mounted in the handheld assembly.